

SECTION J.—PSYCHOLOGY.

---

THE INFLUENCE OF THE LATE W. H. R. RIVERS

(PRESIDENT ELECT OF SECTION J)

ON THE DEVELOPMENT OF PSYCHOLOGY  
IN GREAT BRITAIN.

ADDRESS BY

CHARLES S. MYERS, C.B.E., M.A., M.D., Sc.D., F.R.S.,  
PRESIDENT OF THE SECTION.

---

A MOURNFUL gloom has been cast over the proceedings of our newly born Section. Since its inauguration twelve months ago this Section, as, indeed, Psychology in general, has suffered an irreparable loss through the sudden death, on June 4 last, of him who was to have presided here to-day. When, only a few weeks ago, it fell to me, as one of his first pupils, to occupy Rivers's place, I could think of little else than of him to whom I have owed so much for nearly thirty years of intimate friendship and invaluable advice; and I felt that it would be impossible for me then to prepare a Presidential Address to this Section on any other subject than on his life's work in psychology.

William Halse Rivers was born on March 12, 1864, at Luton, near Chatham, the eldest son of the Rev. H. F. Rivers, M.A., formerly of Trinity College, Cambridge, and afterwards vicar of St. Faith's, Maidstone, and of Elizabeth, his wife, *née* Hunt. Many of his father's family had been officers in the Navy—a fact responsible, doubtless, for Rivers's love of sea voyages. The father of his paternal grandfather, Lieutenant W. T. Rivers, R.N., was that brave Lieutenant William Rivers, R.N., who as a midshipman in the *Victory* at Trafalgar, was severely wounded in the mouth and had his left leg shot away at the very beginning of the action, in defence of Nelson or in trying to avenge the latter's mortal wound. So at least runs the family tradition; also according to which Nelson's last words to his surgeon were: 'Take care of young Rivers.' A maternal uncle of Rivers was Dr. James Hunt, who in 1863 founded and was the first President of the Anthropological Society, a precursor of the Royal Anthropological Institute, and from 1863 to 1866 at the meetings of this Association strove to obtain that recognition for anthropology as a distinct Sub-section or Section which was successfully won for Psychology by his nephew, who presided over us at the Bournemouth meeting in 1919, when we were merely a Sub-section of Physiology.

Our 'young Rivers' gave his first lecture at the age of twelve, at a debating society of his father's pupils. Its subject was 'Monkeys.' He was educated first at a preparatory school at Brighton, and from  
BRITISH ASSOCIATION: Hull, 1922.]

THE  
CHARLES MYERS  
LIBRARY  
NATIONAL INSTITUTE OF INDUSTRIAL PSYCHOLOGY  
14, WELBECK STREET, LONDON, W.1.

1877 to 1880 at Tonbridge School. Thence he had hoped to proceed to Cambridge; but a severe attack of enteric fever compelled him to take a year's rest, and thus prevented him from competing for an entrance scholarship at that University. He matriculated instead in the University of London, and entered St. Bartholomew's Hospital in 1882, sharing the intention of one of his father's pupils of becoming an Army doctor. This idea, however, he soon relinquished; but, like his desire to go to Cambridge, it was to be realised later in life.<sup>1</sup>

When he took his degree of Bachelor of Medicine in 1886 he was accounted the youngest Bachelor ever known at his hospital. Two years later he graduated as Doctor of Medicine, and he spent these two and the two following years in resident appointments at Chichester (1888) and at St. Bartholomew's (1889) hospitals, in a brief period of private medical practice (1890), and in travelling as ship's surgeon to America and Japan (1887), the first of numerous subsequent voyages. In 1891 he became house-physician at the National Hospital, Queen Square, where he first made the acquaintance of Dr. Henry Head, whose collaborator he was to be some twenty years later in one of the most striking neurological experiments ever made.

But before he began work at Queen Square, before he assisted Horsley there in his then wonderful operations on the brain, before he met Head fresh from his studies in Germany and enthusiastic over the colour-vision work and novel physiological conceptions of Hering, Rivers had already shown his interest in the study of the mind and the nervous system. Thus, in 1888, when he was twenty-four years of age, we find in the *St. Bartholomew's Hospital Reports* (Vol. xxiv., pp. 249-251) his first published paper on 'A Case of Spasm of the Muscles of Neck Causing Protrusion of the Head,' and in the following year, in the same *Reports* (Vol. xxv., pp. 279-280), an abstract of a paper read by him before the Abernethian Society entitled 'Delirium and its Allied Conditions.' At this early date he pointed out the analogies between delirium and mania, protested against the use of narcotics in delirium, and condemned the wide separation—too wide even to-day—between diseases of the mind and diseases of the body: In 1891 and in 1893 he read papers to the Abernethian Society, abstracts of which appear in the *St. Bartholomew's Hospital Reports* (vol. xxvii., pp. 285-286, vol. xxix., p. 350), on 'Hysteria' and on 'Neurasthenia,' to which his interests were to return so fruitfully during and after the Great War.

In 1892 he spent the spring and early summer at Jena, attending the lectures of Eucken, Ziehen, Binswanger, and others. In a diary kept by him during this visit to Germany the following sentence occurs: 'I have during the last few weeks come to the conclusion that I should go in for insanity when I return to England and work as much as possible at psychology.' Accordingly, in the same year he became Clinical Assistant at the Bethlem Royal Hospital, and in 1893 he assisted G. H. Savage in his lectures on mental diseases at Guy's

<sup>1</sup> For many of the above details of Rivers's early life and antecedents I am indebted to his sister, Miss K. E. Rivers.

Hospital, laying special stress on their psychological aspect. About the same time, at the request of Professor Sully, he began to lecture on experimental psychology at University College, London.

Meanwhile, at Cambridge Michael Foster was seeking someone who would give instruction there in the physiology of the sense organs, McKendrick having, as Examiner in Physiology, recently complained of the inadequate training of the Cambridge students in this branch of the subject. Foster's choice fell on Rivers, and in 1893 he invited him to the University for this purpose. For a few months Rivers taught simultaneously at Cambridge and at Guy's Hospital and at University College, London. He went to Germany for a short period of study under Professor Kräpelin, then of Heidelberg, whose brilliant analysis of the work curve and careful investigations into the effects of drugs on bodily and mental work had aroused his intense interest. In collaboration with Kräpelin he carried out a brief investigation into mental fatigue and recovery, published in 1896 (*Journal of Mental Science*, vol. xlii., pp. 525-29, and Kräpelin's *Psychologische Arbeiten*, vol. i., pp. 627-78), which indicated that even an hour's rest is inadequate to neutralise the fatigue of half-an-hour's mental work, and paved the way for Rivers's important researches some ten years later upon the effects of drugs on muscular and mental fatigue.

At Cambridge Rivers set himself to plan one of the earliest systematic practical courses in experimental psychology in the world, certainly the first in this country. In 1897 he was officially recognised by the University, being elected to the newly established Lectureship in Physiological and Experimental Psychology. But the welcome and encouragement he received from cognate branches of study at Cambridge could hardly be called embarrassing. Even to-day practical work is not deemed essential for Cambridge honours candidates in elementary psychology; psychology is not admitted among the subjects of the Natural Sciences Tripos; and no provision is made for teaching the subject at Cambridge to medical students. Rivers first turned his attention principally to the study of colour vision and visual space perception: Between 1893 and 1901 he published experimental papers 'On Binocular Colour-mixture' (*Proc. Cambs. Philosoph. Soc.*, vol. viii., pp. 273-77), on 'The Photometry of Coloured Papers' (*J. of Physiol.*, vol. xxii., pp. 137-45), and 'On Erythroptasia' (*Trans. Ophthal. Soc., London*, vol. xxi., pp. 296-305), and until 1908 he was immersed in the task of mastering the entire literature of past experimental work on vision, the outcome of which was published in 1900 as an article in the second volume of the important *Text-book of Physiology* edited by Sir Edward Sharpey Schafer.

This exhaustive article of 123 pages on 'Vision' by Rivers is still regarded as the most accurate and careful account of the whole subject in the English language. It is of special value not only as an encyclopædic storehouse of references to the work of previous investigators—although with characteristic modesty Rivers omits to mention himself among them—but also for the unsurpassed critical account of the principal theories of colour vision. In it he displayed the strength and the weakness of Hering's theory and the untenability of Helmholtz's ex-

planations of successive contrast as due to fatigue, and of simultaneous contrast as due to psychological factors. Rivers clearly showed that the effect of psychological factors is not to create but to mask the phenomena of simultaneous contrast, which are really dependent on what he terms 'the physiological reciprocity of adjoining retinal areas.' His enthusiasm for Hering's theories led him to give by far the most detailed presentation of them that had then or has since appeared in our language. In classifying the phenomena of red-green colour-blindness, on which Helmholtz largely based his trichromatic theory, Rivers proposed the useful terms 'scoterythrous' and 'photerythrous' in place of the terms 'protanopic' and 'deuteranopic,' so as to avoid, in describing these phenomena, the use of names which implied the acceptance of a particular theory of colour vision. These terms have failed, however, to obtain general adoption.

In 1896 Rivers published an important paper 'On the Apparent Size of Objects' (*Mind*, N.S., vol. v., pp. 71-80), in which he described his investigations into the effects of atropin and eserin on the size of seen objects. He distinguished two kinds of micropsia which had hitherto been confused—micropsia at the fixation-point due to irradiation, and micropsia beyond the fixation-point, which is of special psychological importance. Rivers came to the interesting conclusion that the mere effort to carry out a movement of accommodation may produce the same micropsia as when that effort is actually followed by movement. In other words, an illusion of size may be dependent solely on central factors. His later work, in conjunction with Professor Dawes Hicks, on 'The Illusion of Compared Horizontal and Vertical Lines,' which was published in 1908 (*Brit. J. of Psychol.*, vol. ii., pp. 241-60), led him to trace this illusion to origins still less motor in nature. Here horizontal and vertical lines were compared under tachistoscopic and under prolonged exposure. The momentary view of the lines in the tachistoscope precluded any movement or effort of movement of the eyes, which had been supposed by many to be responsible for the over-estimation of vertical lines owing to the greater difficulty of eye movement in the vertical as compared with the horizontal direction. The amount of the illusion was found to be approximately the same for tachistoscopic as for prolonged exposure of the lines, but in the tachistoscopic exposure the judgment was more definite and less hesitating—in other words, more naive, more purely sensory, more 'physiological'—than in prolonged exposure. This result, which led to further work by Dr. E. O. Lewis at Cambridge under Rivers upon the Müller-Lyer illusion and upon the comparison of 'filled' and 'empty' space, is of fundamental psychological importance. Although it is not inconsistent with the view that visual space perception depends *for its genesis* on eye movement, it compels us to admit that visual space perception, *once acquired*, can occur in the absence of eye movement; or, in more general language, that changes in consciousness, originally arising in connexion with muscular activity, may later occur in the absence of that activity. The provision of experimental evidence in favour of so fundamental and wide-reaching a view is obviously of the greatest importance.

In 1898, in which year he was given the degree of Hon. M.A. at Cambridge, Rivers took a fresh path in his varied career by accepting Dr. A. C. Haddon's invitation to join the Cambridge Anthropological Expedition to the Torres Straits. This was the first expedition in which systematic work was carried out in the ethnological application of the methods and apparatus of experimental psychology. His former pupils, Prof. W. McDougall and I, assisted Rivers in this new field. Rivers interested himself especially in investigating the vision of the natives—their visual acuity, their colour vision, their colour nomenclature, and their susceptibility to certain visual geometric illusions. He continued to carry out psychological work of the same comparative ethnological character after his return from the Torres Straits in Scotland (where he and I sought comparative data), during a visit to Egypt in the winter of 1900, and from 1901-2 in his expedition to the Todas of Southern India.

The Torres Straits expedition marked a turning-point in Rivers's life interests, as they were for the first time directed towards ethnological studies, to which he became ardently devoted ever after, until his death removed one who at the time was President of the Royal Anthropological Institute, had in 1920-1 been President of the Folk Lore Society, and had in 1911 been President of Section H (Anthropology) of this Association. His ethnological and sociological work during his expedition to the Todas and during his two subsequent expeditions to Melanesia are too well known to need mention here. It was Rivers's own view that his most important contributions to science are to be found in the two volumes of his 'History of Melanesian Society,' published in 1914.

His psychological investigations among the Torres Straits islanders, Egyptians and Todas (*Reports of the Cambridge Anthropol. Exped. to Torres Straits*, vol. ii., Pt. I., pp. 1-132; *J. of Anthropol. Inst.*, vol. xxxi., pp. 229-47; *Brit. J. of Psychol.*, vol. i., pp. 321-96) will ever stand as models of precise, methodical observations in the field of ethnological psychology. Nowhere does he disclose more clearly the admirably scientific bent of his mind—his insistence on scientific procedure, his delight in scientific analysis, and his facility in adapting scientific methods to novel experimental conditions. He reached the conclusion that no substantial difference exists between the visual acuity of civilised and uncivilised peoples, and that the latter show a very definite diminution in sensibility to blue, which, as he suggested, is perhaps attributable to the higher macular pigmentation among coloured peoples. He observed a generally defective nomenclature for blue, green, and brown among primitive peoples, both white and coloured, and large differences in the frequency of colour-blindness among the different uncivilised peoples whom he examined. In his work on visual illusions he found that the vertical-horizontal-line illusion was more marked, while the Müller-Lyer illusion was less marked, among uncivilised than among civilised communities; and he concluded that the former illusion was therefore dependent rather on physiological, the latter rather on psychological factors, the former being counteracted, the latter being favoured, by previous experience, *e.g.* of drawing lines or of apprehending complex figures as wholes.

In 1903, the year after his return from the Todas, and the year of his election to a Fellowship at St. John's College, Rivers began an investigation, continued for five years, with Dr. Henry Head, in which the latter, certain sensory nerves of whose arm had been experimentally divided, acted as subject, and Rivers acted as experimenter, applying various stimuli to the arm and recording the phenomena of returning cutaneous sensibility. The results of this heroic and lengthy investigation are well known. The discovery of a crude punctate protopathic sensibility, distinct from a more refined epicritic sensibility, so deeply impressed Rivers that a decade later his psychological views may be said to have been centred round this distinction between the ungraded, 'all-or-nothing,' diffusely localising functions of the protopathic system, and the delicately graded, discriminative, accurately localising functions of the epicritic system. The exact interpretation of this 'Human Experiment in Nerve Division,' published at length in 1908 (*Brain*, vol. xxxi., pp. 323-450), has been disputed by subsequent workers, whose divergent results, however, are at least partly due to their employment of different methods of procedure. Head's experiment has never been identically repeated, and until this has been done we are probably safe in trusting to the results reached by the imaginative genius and the cautious critical insight of this rare combination of investigators. At a far higher nervous level broad analogies to this peripheral analysis of cutaneous sensibility were later found by Head when thalamic came to be compared with cortical activity and sensibility.

While working with Head upon his arm Rivers's indomitable activity led him to simultaneous occupation in other fields. In 1904 he assisted Professor James Ward to found and to edit the *British Journal of Psychology*, and in that year he also received an invitation to deliver the Croonian Lectures in 1906 at the Royal College of Physicians, of which in 1899 he had been elected a Fellow. The study of drug effects had long interested him. In a paper on 'Experimental Psychology in Relation to Insanity,' read before the Medico-Psychological Society in 1895 (*Lancet*, vol. lxxiii., p. 867), he had drawn the attention of psychiatrists to the comparability of drug effects with the early stages of mental disorders before they were seen by the physician. And so, reverting to the work he had done under Kräpelin many years previously, he chose as his subject for the Croonian Lectures *The Influence of Alcohol and other Drugs on Fatigue* (Arnold, 1908). But although he utilised Kräpelin's ergograph and many of Kräpelin's methods, Rivers's *flair* for discovering previous 'faulty methods of investigation' and his devotion to scientific methods and accuracy could not fail to advance the subject. Of no one may it be more truly said than of him,—*nihil tetigit quod non ornavit*. He felt instinctively that many of the supposed effects of alcohol were really due to the suggestion, interest, excitement or sensory stimulation accompanying the taking of the drug. Accordingly he disguised the drug, and prepared a control mixture which was indistinguishable from it. On certain days the drug mixture was taken, on other days the control mixture was taken, the subject never knowing which he was drinking. Rivers engaged Mr. H. N. Webber as a subject who could devote himself to the investi-

gation so completely as to lead the necessarily uniform life while it was being carried out. He found that the sudden cessation of all tea and coffee necessary for the study of the effects of caffeine induced a loss of energy, and that other mental disturbance might occur through giving up all forms of alcoholic drink. Therefore most of his experiments were carried out more than twelve months after the taking of these drinks had been discontinued. Instead of recording a single ergogram Rivers took several sets of ergograms each day, each set consisting usually of six ergograms taken at intervals of two minutes, and separated from the next set by an interval of thirty or sixty minutes. He arranged that the drug mixture or the control mixture should be taken after obtaining the first set of ergograms, which served as a standard wherewith subsequent sets on the same day might be compared. He worked with Mr. Webber on alcohol and caffeine, and was followed by the similar work of Dr. P. C. V. Jones in 1908 on strychnine, and of Dr. J. G. Slade in 1909 on Liebig extract.

With these vast improvements in method Rivers failed to confirm the conclusions of nearly all earlier investigators on the effects of from 5 to 20 c.c. of absolute alcohol on muscular work. His results with these doses, alike for muscular and mental work, were mainly negative, and indeed with larger doses (40 c.c.) were variable and inconclusive; although an equivalent quantity of whisky gave an immediate increase of muscular work—a result which strongly suggests the influence of sensory stimulation rather than the direct effect of the drug on the central nervous system or on the muscular tissues. Rivers concluded that alcohol may in some conditions favourably act on muscular work by increasing pleasurable emotion and by dulling sensations of fatigue, but that probably its most important effect is to depress higher control, thus tending to increase muscular and to diminish mental efficiency. Working with caffeine, Rivers also obtained effects much less pronounced than those recorded by several earlier observers. He adduced evidence to indicate that (like alcohol) caffeine has a double action on muscular activity, the one immediately increasing the *height* of the contractions obtained and persisting, the other producing an initial slow, transitory increase in the *number* of the contractions, and then a fall. Following Kräpelin, he suggested that the former action represents a peripheral, the latter a central effect.

He also put forward novel suggestions as to the true course of the fatigue curve, and laid stress on the importance of carrying out ergographic work by peripheral electrical stimulation. These views are certain to bear fruit in the future. Indeed, it may be safely said that no one can henceforth afford to investigate the effect of drugs on the intact organism without first mastering Rivers's work on the subject.

From the concluding passages of these Croonian lectures the following sentences may be aptly cited: 'The branch of psychology in which I am chiefly interested is that to which the name of individual psychology is usually given. It is that branch of psychology which deals with the differences in the mental constitutions of different peoples, and by an extension of the term to the differences which characterise the members of different races. . . . These experiments leave little doubt

that variations in the actions of drugs on different persons may have their basis in deep-seated physiological variations, and I believe that the study of these variations of susceptibility may do more than perhaps any other line of work to enable us to understand the nature of temperament and the relation between the mental and physical characters which form its two aspects.'

Rivers's interests did not lie in the collection of masses of heterogeneous data, in obtaining blurred averages from vast numbers of individuals, in concocting mathematical devices, or in applying mathematical formulæ to the numerical data thus accumulated; they lay throughout his varied career in studying and analysing individual mental differences, in getting to know the individual in his relation to his environment. In ordinary circumstances, as he later said, 'There is too little scope for the variations of conditions which is the essence of experiment. . . . While the experimental method as applied to the normal adult has borne little fruit, it would be difficult to rate too highly the importance of experiment in discovering and testing methods to be used in other lines of psychological inquiry where a wider variation of conditions is present' (*Brit. J. of Psychol.*, vol. x., p. 185).

It was the importance of studying the play of the most variable conditions that led Rivers to investigate, as we have seen, first racial mental differences, then the differences produced in a given individual by nerve section, and finally those produced in different individuals by different drugs. Throughout his life he was steadfast to the biological standpoint, correlating the psychological with the physiological, and hoping to discover different mental levels corresponding to different neural levels.

And so we approach the last phase of Rivers's psychological work, the outcome of his war experiences. In 1907 he had given up his University teaching in experimental psychology; for six years before the war he had published nothing of psychological or physiological interest. This was a period in which Rivers devoted himself wholly to the ethnology and sociology of primitive peoples. The outbreak of war found him for the second time visiting Melanesia for ethnological field work. Failing at first to get war work on his return to England, Rivers set himself to prepare the Fitzpatrick Lectures on 'Medicine, Magic and Religion,' which he had been invited to deliver to the Royal College of Physicians of London in 1915 and 1916. In 1915 his psychological and ethnological researches were recognised by the award to him of a Royal Medal by the Royal Society, of which he had been elected a Fellow in 1908. In July 1915 he went as medical officer to the Maghull War Hospital, near Liverpool, and in 1916 to the Craiglockhart War Hospital, Edinburgh, receiving a commission in the R.A.M.C. In these hospitals he began the work on the psychoneuroses that led him to his studies of the unconscious and of dreams, which resulted in his well-known book, *Instinct and the Unconscious*, published first in 1920 (already in a second edition), and in a practically completed volume on *Conflict and Dream*, which is to be published posthumously. From 1917 he acted as consulting psychologist to the Royal Air Force, being attached to the Central Hospital at Hampstead.



This period not merely marks a new phase in Rivers's work, but is also characterised by a distinct change in his personality and writings. In entering the Army and in investigating the psychoneuroses he was fulfilling the desires of his youth. Whether through the realisation of such long-discarded or suppressed wishes, or through other causes, *e.g.* the gratified desire of an opportunity for more sympathetic insight into the mental life of his fellows, he became another and a far happier man. Diffidence gave place to confidence, hesitation to certainty, reticence to outspokenness, a somewhat laboured literary style to one remarkable for its ease and charm. Over forty publications can be traced to these years, between 1916 and the date of his death. It was a period in which his genius was released from its former shackles, in which intuition was less controlled by intellectual doubt, in which inspiration brought with it the usual accompaniment of emotional conviction—even an occasional impatience with those who failed to accept his point of view. But his honest, generous character remained unchanged to the last. Ever willing to devote himself unsparingly to a cause he believed right, or to give of his best to help a fellow-being in mental distress, he worked with an indomitable self-denying energy, won the gratitude and affection of numberless nerve-shattered soldier-patients, whom he treated with unsurpassed judgment and success, and attracted all kinds of people to this new aspect of psychology. Painters, poets, authors, artisans, all came to recognise the value of his work, to seek, to win, and to appreciate his sympathy and his friendship. It was characteristic of his thoroughness that while attached to the Royal Air Force he took numerous flights, 'looping the loop' and performing other trying evolutions in the air, so that he might gain adequate experience of flying and be able to treat his patients and to test candidates satisfactorily. He had the courage to defend much of Freud's new teaching at a time when it was carelessly condemned *in toto* by those in authority who were too ignorant or too incompetent to form any just opinion of its undoubted merits and undoubted defects. He was prepared to admit the importance of the conflict of social factors with the sexual instincts in certain psychoneuroses of civil life, but in the psychoneuroses of warfare and of occupations like mining he believed that the conflicting instincts were not sexual, but were the danger instincts, related to the instinct of self-preservation.

Thus in the best sense of the term Rivers became a man of the world and no longer a man of the laboratory and of the study. He found time to serve on the Medical Research Council's Air Medical Investigation Committee, on its Mental Disorders Committee, on its Miners' Nystagmus Committee, and on the Psychological Committee of its Industrial Fatigue Research Board. He served on a committee, of ecclesiastical complexion, appointed to inquire into the new psychotherapy, and he had many close friends among the missionaries, to whom he gave and from whom he received assistance in the social and ethnological side of their work.

In 1919, in which year he received honorary degrees from the Universities of St. Andrews and Manchester, he returned to Cambridge

as Prælector in Natural Sciences at St. John's College, and began immediately to exercise a wonderful influence over the younger members of the University by his fascinating lectures, his 'Sunday evenings,' and above all by his ever-ready interest and sympathy. As he himself wrote, after the war work 'which brought me into contact with the real problems of life . . . I felt that it was impossible for me to return to my life of detachment.' And when a few months before his death he was invited by the Labour Party to a still more public sphere of work, viz., to become a Parliamentary candidate representing the University of London, once again he gave himself unsparingly. He wrote at the time: 'To one whose life has been passed in scientific research and education the prospect of entering practical politics can be no light matter. But the times are so ominous, the outlook both for our own country and the world so black, that if others think I can be of service in political life I cannot refuse.' On several occasions subsequently he addressed interested London audiences, consisting largely of his supporters, on the relations between Psychology and Politics. It was one of these very lectures—on the Herd Instinct—at which it happened that I took the chair, which was to have formed the basis of his Presidential Address to you here to-day.

Rivers's views on the so-called herd instinct were the natural outcome of those which he had put forward during the preceding five years and collected together in his *Instinct and the Unconscious*. His aim in writing this book was, as he says, 'to provide a biological theory for the psychoneuroses,' to view the psychological from the physiological standpoint. He maintained that an exact correspondence holds between the inhibition of the physiologist and the repression of the psychologist. He regarded mental disorders as mainly dependent on the coming to the surface of older activities which had been previously controlled or suppressed by the later products of evolution. Here Rivers went beyond adopting Hughlings Jackson's celebrated explanation of the phenomena of nervous diseases as arising largely from the release of lower-level activities from higher-level controls. He further supposed that these lower-level activities represent earlier racial activities held more or less in abeyance by activities later acquired. This conception he derived from his work with Henry Head on cutaneous sensibility. Rivers could see but 'two chief possibilities' of interpreting the phenomena disclosed in the study of Head's arm. Either epicritic sensibility is protopathic sensibility in greater perfection, or else protopathic sensibility and epicritic sensibility represent two distinct stages in the development of the nervous system. Failing to see any other explanation, he adopted the second of these alternatives. He supposed that at some period of evolution, when epicritic sensibility, with its generally surface distribution, its high degree of discrimination, and its power of accurate localisation, made its appearance, the previously existing protopathic sensibility, with its punctate distribution, its 'all-or-nothing' character, and its broad radiating localisation, became in part inhibited or 'suppressed,' in part blended or 'fused' with the newly acquired sensibility so as to form a useful product. He supposed that the suppressed portion persisted in a condition of

unconscious existence, and he emphasised the biological importance of suppression. He considered at first that the protopathic sensibility 'has all the characters we associate with instinct,' whereas the later epicritic sensibility has the characters of intelligence or reason. So he came to hold that instinct 'led the animal kingdom a certain distance in the line of progress,' whereupon 'a new development began on different lines,' 'starting a new path, developing a new mechanism which utilised such portions of the old as suited its purpose.'

*Evolutio per saltus* was thus the keynote of Rivers's views on mental development. Just as the experience of the caterpillar or tadpole is for the most part suppressed in the experience of the butterfly or frog, so instinctive reactions tend to be suppressed in intelligent experience whenever the immediate and unmodifiable nature of the one becomes incompatible with the diametrically opposite characters of the other. Just as parts of the protopathic fuse with the later acquired epicritic sensibility, so parts of our early experience, of which other parts are suppressed, fuse with later experience in affecting adult character. 'Experience,' he explained, 'becomes unconscious because instinct and intelligence run on different lines and are in many respects incompatible with one another.'

Rivers was compelled later to recognise 'epicritic' characters in certain instincts. He came to suppose that 'the instincts connected with the needs of the individual' and with the early preservation of the race are mainly 'of the protopathic kind,' whereas the epicritic group of instincts first appeared with the development of gregarious life. He recognised the epicritic form of mental activity in the instincts connected with the social life, especially of insects, and also in the states of hypnosis and sleep. Finally, he doubted the validity of the usual distinctions between instinct and intelligence.

Throughout his work on this wide subject Rivers endeavoured to give a strict definition to words which had hitherto been ambiguously or loosely used. He defined *unconscious experience* as that which is incapable of being brought into the field of consciousness save under such special conditions as 'sleep, hypnosis, the method of free association and certain pathological states.' He defined *repression* as the self-active, 'witting' expulsion of experience from consciousness, and *suppression* as the 'unwitting' process by which experience becomes unconscious. Thus suppression may occur without repression. When one refuses to consider an alternative path of action, one represses it; when a memory becomes 'of itself' inaccessible to recall, it is suppressed. When such a suppressed experience acquires an independent activity which carries with it an independent consciousness, it undergoes, according to Rivers's usage of the term, *dissociation*. Thus suppression may occur without dissociation. In its most perfect form, according to Rivers, suppression is illustrated by the instinct of immobility which forms one of the reactions to danger; the fugue (as also somnambulism) is 'a typical and characteristic instance of dissociation.'

From his point of view Rivers was naturally led, wherever possible, to interpret abnormal mental conditions in terms of regression to more

primitive, hitherto suppressed activities. He held that the hysterias are essentially 'substitution neuroses,' connected with and modified by the gregarious instincts, and are primarily due to a regression to the primitive instinctive danger reaction of immobility, greatly modified by suggestion. So, too, he held that the anxiety neuroses, which are for him essentially 'repression neuroses,' also show regression, though less complete, in the strength and frequency of emotional reaction, in the failure during states of phantasy to appreciate reality, in the reversion to the nightmares, and especially the terrifying animal dreams, characteristic of childhood, in the occurrence of compulsory acts, in the desire for solitude, &c. Indeed, because he believed that suppression is especially apt to occur, and to be relatively or absolutely perfect, in infancy, Rivers suggested that the independent activity of suppressed experience and the process of dissociation, as exemplified in fugues, complexes, &c., are themselves examples of regression.

He criticised Freud's conception of the censorship, substituting in place of that anthropomorphically-coloured sociological parallel the physiological and non-teleological conception of regression. He supposed the mimetic, fantastic, and symbolic forms in which hysterias and dreams manifest themselves to be natural to the infantile stages of human development, individual or collective. For him they were examples of regression to low-level characters, and not, as Freud supposes, ascribable to compromise formations to elude the vigilance of an all-protective censor. He regarded nightmares and war-dreams as examples of infantile states. He believed the absence of affect in many normal dreams to be natural to the infantile attitude, which would treat the situation in question with indifference. That absence of affect also arises from the harmless symbolic solution of the conflict. The affect of dreams is only painful, Rivers supposed, when they fail to provide a solution of the conflict, and is not due, as Freud holds, to the activity of the censor. In the social behaviour of primitive communities Rivers was able to find striking analogies to the characteristics of dreams, as described by Freud.

On the protopathic side he ranged the primitive instincts and emotions, and the complexes, together with the activities of the optic thalamus, and on the epicritic side intelligence and the sentiments, together with the activities of the cerebral cortex. We are now in a position to examine Rivers's treatment of the gregarious behaviour of animal and human life, on which he was still engaged at the time of his death. In the gregarious instinct he recognised a cognitive aspect which he termed 'intuition,' an affective aspect which he termed 'sympathy,' and a motor aspect which he termed 'mimesis.' He used 'mimesis' for the process of imitation so far as it was unwitting, 'Sympathy' he regarded as always unwitting. 'Intuition' he defined as the process whereby one person is unwittingly influenced by another's cognitive activity. But I feel sure that the term 'unwittingly' is not to be considered here as equivalent to 'telepathically.' All that Rivers meant was that the person is influenced by certain stimuli without appreciating their nature and meaning. He preferred to employ the term 'suggestion' as covering

all the processes by which one mind acts on or is acted on by another unwittingly. He supposed that in the course of mental evolution epicritic characters displaced the early protopathic characters of instinctive behaviour owing to the incidence of gregarious life, especially among insects, and owing to the appearance and development of intelligence, especially in man. The suggestion inherent in gregarious behaviour implies some graduation of mental and bodily activity—an instinctive and unwitting discrimination distinct from the witting discrimination of intelligence. Suggestion, in primitive gregarious behaviour, as also in the dissociated state of hypnosis, and in its allied form, ordinary sleep, is prevented if witting processes be active; it 'is a process of the unconscious,' said Rivers. Both within the herd and during hypnosis, which he believed to be fundamentally of a collective nature, sensibility is heightened, so that the organism may be able to react to minute and almost imperceptible stimuli. Were he here to-day Rivers would have carried this conception of the evolution of gregarious life still further by distinguishing between the more lowly leaderless herd and the herd which has acquired a definite leader. He would have traced the development of the new affect of submission and of the new behaviour of obedience to the leader, and he would doubtless have accredited the leader with the higher affects of superiority and felt prestige, with the higher cognition that comes of intuitive foresight, and with the higher behaviour of intuitive adaptation, initiative, and command. I expect, too, that he would have sketched the development of still later forms of social activity, complicated by the interaction and combination of intellectual and instinctive processes—the witting deliberations and decisions on the part of the leader, and the intellectual understanding of the reasons for their confidence in him and for their appropriate behaviour on the part of those who are led.

But it would be idle further to speculate on the ideas of which we have been robbed by Rivers's untimely death. Let us rather console ourselves with the vast amount of valuable and suggestive material which he has left behind and with the stimulating memories of one who, despite the fact that his health was never robust, devoted himself unsparingly to scientific work and to the claims of any deserving human beings or of any deserving humane cause that were made upon him. There are, no doubt, some who believe that Rivers's earlier experimental psychological work—on vision; on the effects of drugs, and on cutaneous sensibility—is likely to be more lasting than his later speculations on the nature of instinct, the unconscious, dreams, and the psychoneuroses. No one can doubt the scientific permanence of his investigations in the laboratory or in the field; they are a standing monument to us of thoroughness and accuracy combined with criticism and genius. But even those who hesitate to suppose that at some definite period in mental evolution intelligence suddenly made its appearance and was grafted on to instinct, or that epicritic sensibility was suddenly added to a mental life which had before enjoyed only protopathic sensibility—even those who may not see eye to eye with Rivers on these and other fundamental views on which much of his later work rested, will be foremost in recognising the extraordinarily stimulating, suggestive, and fruitful

character of all that he poured forth with such astounding speed and profusion during the closing years of his life. And above all we mourn a teacher who was not merely a man of science devoted to abstract problems, but who realised the value of and took a keen delight in applying the knowledge gained in his special subject to more real and living problems of a more concrete, practical, everyday character. Rivers's careful methods of investigating cutaneous sensibility and the *rationale* of his successful treatment of the psychoneuroses were directly due to his psychological training. So, too, his epoch-making discoveries and his views in the field of anthropology on the spread and conflict of cultures were largely due to the application of that training. Shortly before his death he was developing, as a committee member of the Industrial Fatigue Research Board, an intense interest in that youngest application of psychology, viz., to the improvement of human conditions in industrial and commercial work by the methods of experimental psychology applied to fatigue study, motion study, and vocational selection.

Unhappily, men of such wide sympathies and understanding as Rivers, combined with a devotion to scientific work, are rare. He himself recognised that 'specialisation has . . . in recent years reached such a pitch that it has become a serious evil. There is even a tendency,' he rightly said, 'to regard with suspicion one who betrays the possession of knowledge or attainments outside a narrow circle of interests' (*Brit. J. of Psychol.*, vol. x., p. 184). Let his life, his wisdom, his wide interests, sympathies and attainments, and the generosity and honesty of his character, be an example to us in the common object of our meeting this week—the Advancement of Science.



